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ENTOMOLOGY.<sup>1</sup>

**The Pupa of *Argyramæba cædipus* Fab.**—The description given below is drawn from a pupal skin sent to me with the fly by Prof. C. P. Gillette, who bred the latter from a nest of *Odynerus* sp., at Fort Collins, Colo. In a paper which will be published in *Psyche*, I have described the pupa of *Toxophora virgata* O. S., and also made some mention of the pupæ of Bombyliidæ which have so far been described. The pupa of the present species differs quite markedly in detail from that of the *Toxophora* above mentioned.

Pupa of *Argyramæba cædipus*: General color of empty pupal skin very pale straw colored; the cephalic horns black, reddish-brown basally, anal horns black, slightly reddish-brown at base; dorsal rows of ridges reddish-brown, the terminal spinous processes blackish; prothoracic spiracles reddish-brown, other spiracles but little darker than rest of integument, slightly brownish. Head conforming to shape of head of adult fly, more or less sub-spherical in form. Eight cephalic horns or teeth arranged in four pairs, the three anterior pairs joined in a common base, the posterior pair removed from others; anterior pair longest, their rufous brown joined basal portion distinctly shorter than their black free terminal portion, moderately slender, nearly straight, directed forward, gradually tapering to tips; second and third pairs more closely approximated one pair to the other than are the first and second pairs, but the two horns of each pair widely removed from each other, both pairs directed nearly forward but at a slightly more downward angle than first pair; third pair much shorter than second, more curved or claw-like; posterior pair closely approximated at base, nearly as large as third pair, but straight and directed inferiorly, situated nearly in middle of ventral surface of head segment; a pair of quite widely separated divergent bristles on outer dorsal surface of anterior cephalic horns; a more approximated nearly parallel pair just posterior to these but arising from integument of head near anterior dorsal edge, being situated just behind the suture at base of cephalic horns; a divergent pair situated just anterior to base of the posterior of fourth pair of cephalic horns; a small bristle on each side at hind margin of ventral surface of cephalic segment. Thorax a little wider than head, the neck being somewhat constricted; a pair of

<sup>1</sup>This department is edited by Clarence M. Weed, Hanover, N. H.

closely approximated short bristles arising from the same papilla on lateral dorsal surface of thorax a little anterior to middle; a bristle below these on pleural surface, another still below and a little anterior to this one. Wing cases reaching about to base of third abdominal segment, leg cases a little longer. Scutellar segment about as wide as thorax, with a transverse row of ten or eleven long, more or less curled hairs on each side of dorsum approximated to anterior margin, there being a bare space on median portion of segment between the inner ends of the rows; about ten somewhat longer similar hairs on extreme lateral portion of segment on each side, arranged in a more or less complete semicircle, the open portion of the semicircle being toward the posterior end of body; the lateral hairs are longer and slightly stouter than those of dorsum, being nearly as long as transverse width of segment. Abdominal segments one to four, about same width as scutellar segment, each armed on dorsum with a transverse row of short longitudinal parallel chitinous ridges or very narrow plates, there being thirteen in a row on first and second segments, twelve on third segment, and nine on fourth, the rows a little approximated to posterior margin of segment, especially in middle; these ridges are about two-sevenths as long as length of segment, those in middle of rows being the largest and heaviest, the outer ones shorter and diminishing in size, those on fourth segment less heavy than those of first to third segments, and each ridge is produced at its ends into a spinous or hook-like process, the ridges in profile presenting a crescentic appearance with the concavity uppermost. The other abdominal segments without these rows of ridges, fifth segment nearly as wide as preceding, sixth segment hardly narrower than fifth, the fifth and sixth segments each with a transverse continuous row of hairs on dorsum arising from a transverse ridge, extending down to lateral ventral edge of segment and continued on sides of venter, these rows somewhat approximated to posterior margin of segment. Segments (abdominal) one to four with a thin transverse row of shorter weak hairs on each side of dorsum, arising in posterior edge of rows of ridges, extending down on each side to lateral margin, no hairs on median dorsal portion; same segments with a more or less complete lateral semicircle of longer hairs as on scutellar segment, but somewhat weaker and shorter than those on that segment, the hairs on fourth segment extending beneath on sides of venter. Seventh abdominal segment much narrowed, rapidly and evenly narrowing from base to posterior margin, its width on posterior margin hardly more than one-third its width anteriorly, its mean width about one-half that of sixth

segment, with a transverse row of several hairs on each side of dorsum extending below on edge of venter, discontinued in middle on dorsum, slightly approximated to posterior margin of segment. Eighth or anal segment narrow, same width as posterior margin of seventh, nearly as long (to base of horns) as wide, terminated by three pairs of anal horns; anterior or upper pair short, small, situated at base dorsally of middle pair; middle or second pair long, curved slightly upward terminally, nearly as long as length of segment, widened inwardly on basal half so that the bases are closely approximated, inner outline hollowed out on apical portion, longitudinally corrugated at base above, with a dorsal longitudinal groove widening to hollowed portion and then extending narrowly to tip, moderately sharp at tips; third- or inferior pair short, small, hardly as large as anterior pair and not so stout at base, directed more downward than middle pair, situated on outer base ventrally of middle pair; just anterior to first pair on dorsum there is a median very small spinous tubercle, apparently a rudiment (or herald) of a fourth pair of anal horns. Prothoracic spiracle situated on lateral front border of thorax (prothorax) just anterior to wing bases, mesothoracic spiracle not apparent, metathoracic spiracle situated anteriorly on lateral edge of dorsum of scutellar segment; first to sixth abdominal pairs of spiracles situated on anterior edge laterally of dorsum of first to sixth abdominal segments; seventh pair situated one on each side of dorsum of seventh segment immediately behind the transverse row of hairs. It is interesting to note that a quite long section of the tracheæ is left attached in most cases to the spiracles on inside of the pupal skin, especially to the thoracic pairs. The fly escaped by the pupal skin splitting along the dorsal median line of the head and thorax, the slit extending slightly into the scutellar segment; also splitting laterally backward on each side of head from a little above the base of anterior cephalic horns along what would nearly correspond to the frontal fissure in Muscidæ, the break curving shortly and obliquely upward to thoracic suture, and allowing the nearly triangular posterior dorsal or upper section of the integument of the head to become loosened laterally below from its junction with the thorax, and hanging like a flap by its median dorsal junction.

Length,  $9\frac{1}{2}$  mm.; width of basal abdominal segments,  $2\frac{1}{2}$  mm.

The anal extremity of this pupal skin is distended with a dirty colored hardened fluid ventrally, just below and anterior to anal horns, into a large round tubercle with a subcentral deep pit or orifice-like depression which is approximated to posterior margin, the anterior portion of the tubercle being greatly bulged and distended. The

diameter of this false tubercle is as great as the posterior width of the sixth abdominal segment. The fluid which distended it is perhaps homologous with the meconium of butterflies.

The description of the manner in which the pupal skin splits to allow the escape of the fly was omitted in the description of the pupa of *Toxophora virgata* in the article above referred to. It is accomplished in the same way as just described for the present species, except that the dorsal median split does not reach posterior margin of thorax, and the dorsal pieces of head are not so much detached from their lateral thoracic fastenings, and are left more quadrangular in shape by the oblique lateral breaks of head. It may also be mentioned that a section of the tracheæ is left attached to inside of prothoracic spiracles.

My reasons for calling the first abdominal segment of other authors the scutellar segment, are stated in the article on *Toxophora*.

C. H. TYLER TOWNSEND.

**The Horn-Fly in Canada and Texas.**—Mr. James Fletcher, Entomologist to the Canadian Department of Agriculture, announces<sup>2</sup> that the Horn-fly (*Hematobia serrata*) has appeared in enormous numbers in the Provinces of Ontario and Quebec, causing considerable anxiety to stock-owners. It was first definitely heard from at Oshawa, Ont., July 30, 1892. An excellent résumé of the life-history of the pest and of the means of preventing its injuries is given.

That this insect is also spreading rapidly in the southwest is shown by the following note from Dr. Mark Francis, of the Texas Agricultural College, who wrote me under date of Oct. 18, 1892, from College Station: "The horn-fly seems to be spreading westward. I saw it at Stillwater, Oklahoma, two weeks ago. It has not reached here yet, but I saw great numbers of them at Hempstead, Texas (forty miles southeast of here) last Friday. I think there can be no doubt as to its identity, as I have compared them with type specimens from Prof. H. Garman, of Kentucky."

Two days later Dr. Francis again wrote that the horn-fly was observed at College Station, Oct. 19, for the first time.

In Southern New Hampshire this insect has been very numerous the past season, and it has been gradually spreading northward through New England. But a hopeful report comes from New Jersey, where the insect was first observed. Prof. J. B. Smith states that it now causes little trouble there, and is seldom noticed as specially abundant.

<sup>2</sup>Central Exper. Farm, Ottawa, Bull. No. 14.

**The Wheat Frit-Fly.**—Dr. Otto Lugger reports<sup>3</sup> extensive damage to wheat in the northwest by a larva supposed to belong to one of the frit flies. The stem is injured about three inches above the ground, the larvæ occurring immediately above a node. The insect so weakens the plant at this point that the stalk falls over some time before harvest, the grains do not fill out, and reaper passes over the fallen stem. The puparia resemble the “flaxseed” state of the Hessian fly, and are found within the culm. It is supposed that the insect hibernates with the puparia. Burning and plowing under the stubble are the remedial measures recommended. This is apparently the worst frit-fly attack on wheat yet recorded in America. Dr. Lugger says that in many places fully one-fourth of the entire crop of wheat has been destroyed and in a great many more the losses amount to at least one-tenth.

**Entomological Notes.**—That excellent periodical, *Entomological News*, has instituted a department of economic entomology, with Prof. J. B. Smith in charge. This magazine will prove very useful to amateur as well as professional entomologists, and deserves cordial support. There has lately been a tendency to insert only very short articles, or to continue a single article through several issues (some-what after the fashion of *Entomologica Americana*), which is unsatisfactory to all concerned.

Mr. M. H. Beckwith discusses<sup>4</sup> the injuries of the strawberry weevil (*Anthonomus musculus*) in Delaware, and reports finding the larvæ feeding upon the ovaries of strawberry blossoms. He surmises that there may be two or possibly three broods each year, but has been unable to trace the life-history of the insect during the latter summer months.

Concerning the recent bestowal by the University of Heidelberg of the honorary degree of Doctor of Natural Science upon Baron C. R. von Osten Sacken, Prof. S. W. Williston writes:<sup>5</sup> “Baron Osten Sacken’s work has been chiefly related to American Dipterology, but the ripe fruits of his wide experience and broad grasp of principles have enriched all dipterology, and, I believe, all entomology. Others there are and have been who have won enviable honors in systematic dipterology; others who have written more extensively than he, but no one has written more that will be appreciated in the future than has Baron Osten Sacken.

<sup>3</sup>Minn. Exp. Station, Bull. No. 23.

<sup>4</sup>Delaware College Exp. Station, Bull. No. xviii.

<sup>5</sup>*Psyche*, Vol. 6, p. 346.

Dr. J. C. Neal discusses<sup>6</sup> a number of injurious insects that have appeared in Oklahoma. He includes *Pieris rapæ*, *Plusia brassicæ*, *Heliothis armigera*, *Diabrotica vittata*, *Lytta cinerea*, *Oncideres cingulata*, and *Blissus leucopterus*.

The recent biennial report of Prof. S. A. Forbes as Director of the Illinois State Laboratory of Natural History, shows that entomological studies are being vigorously prosecuted in that favored State. Fully 20,000 specimens have been added to the pinned collections, and 2700 bottles and vials to the biological series. We are glad to note the announcement to two important papers soon to appear in the Bulletin of the laboratory, the first by Mr. John Marten, containing descriptions of new species of Illinois gall gnats, and the second by Mr. C. A. Hart, a descriptive list of the aculeate Hymenoptera of Illinois.

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## PSYCHOLOGY.

**Notes on Habits of Certain European Birds.**—M. Ch. von Kempen has recently published some observations on birds from which the following extract is quoted to show the voracity of the ordinary sparrow-hawk (*Accipiter nisus*):

“For several years I lived in the country, and was accustomed to write during the summer near an open window. The apartment had from one side a view of the garden; from the other one looked out over the fields. Suddenly I saw a sparrow-hawk dart through the room; he flew with such violence that he broke the glass of the window, against which he dashed in his impetuous flight. I soon had an explanation of the circumstance. A linnet (*Sylvia hortensis*) perched near me was evidently the attraction. The warbler had flown into the room to escape the hawk, which in headlong pursuit, had gone through the room like an arrow from a bow.

“In February, 1889, I had in my town garden a certain number of lapwings (*Vanellus cristatus*); each evening, when I would go to shut them up in a cage, I would find one less than I had counted in the morning; I attributed this loss to a cat belonging in the neighborhood. The third day on missing another of my pets, I resolved to discover the thief, and concealed myself for that purpose. In the morning I saw a sparrow-hawk coming straight to my garden from the old tower

<sup>6</sup>Oklahoma Agri. Exp. Station, Bull. No. 3.